



# **The RPSG**

**The Renal Patient Support Group**

**Surgery & Renal Biopsy**

# Renal Biopsy

- Renal biopsy is often necessary for diagnosis, prognostic assessment and therapy guidance for disease management post-transplant (Brachemi and Bollee 2014).
- A renal biopsy is a relatively safe procedure with a well-defined risk profile enabling patients to make shared decisions (Dhaun et al. 2014).
- Renal Biopsy can help deliver specific molecular and cellular patterns of disease (Dhaun et al. 2014).



- Dhaun, N., Bellamy, C., O., Cattran, D., C., et al. (2014). Utility of renal biopsy in the clinical management of renal disease, *Kidney International*, 85, 1039-1048.
- Brachemi, S., Bollee, G. (2014). Renal biopsy practice: What is the gold standard? *World J. Nephrol.*, 3, 287-294.

## Renal Biopsy

- Renal biopsy can be key to characterizing CKD and is an essential part of disease management. Biopsy allows initiation of appropriate treatments with the view of slowing down CKD progression and ultimately avoiding ESRD (Dhaun et al. 2014).
- Renal biopsy also helps facilitate 'bedside to bench' research that further defines mechanism and pathogenesis of disease and potential avenue for new therapies (Dhaun et al. 2014).



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## Purposes of Renal Biopsy

- Unexplained acute or rapidly progressive renal failure,
- Nephrotic syndrome and significant non-nephrotic proteinuria,
- Persistent glomerular haematuria,
- Systemic diseases with renal involvement,
- Renal Allograft Dysfunction



# Renal Biopsy Procedure

- A renal biopsy should include at least 10 glomeruli. The minimum sample size for diagnosis varies depending on the underlying diagnosis (Dhaun et al. 2014).
- A biopsy sample needs to be processed under light and electron microscopy, as well as immunofluorescence (Dhaun et al. 2014).
- The current standard procedure for renal biopsy involves the use of real-time ultrasound to guide an automated spring-loaded biopsy device (Dhaun et al. 2014).



# Renal Biopsy Procedure

- Computed tomography-guided renal biopsy is an alternative imaging tool (Dhaun et al. 2014).
- Renal biopsy is usually performed in prone position. However, if the patient is obese or has breathing difficulty, then a supine position is more suitable (Agarwal and Dinda 2013).
- Biopsies are usually performed after ultrasound marking or under real-time, ultrasound guidance (Dhaun et al. 2014).



- Dhaun, N., Bellamy, C., O., Cattran, D., C., et al. (2014). Utility of renal biopsy in the clinical management of renal disease, *Kidney International*, 85, 1039-1048.
- Agarwal, S., K., Dinda, A., K. (2013). Basics of kidney biopsy: A nephrologist's perspective, *Indian. J. Nephrol.*, 23, 243-252.



## Laparoscopic Renal Biopsy

- Renal biopsy under direct vision. This method allows positive identification of kidneys for a macroscopic diagnosis (Agarwal and Dinda 2013).
- Laparoscopic biopsy has many advantages, including reduced wound infections, safe reliable and potentially more accurate (Agarwal and Dinda 2013).
- However, it requires general anaesthesia, is costly and more invasive than percutaneous biopsy procedure (Agarwal and Dinda 2013).





## Trans-Jugular Renal Biopsy

- Trans-jugular biopsy is performed in an angiography suite. An internal jugular is performed under ultrasound guidance. The right side is preferential (Agarwal and Dinda 2013).
- Biopsy needle is inserted into a renal vein and tissue sample is obtained with the aid of a spring-loaded gun (Agarwal and Dinda 2013).
- It is safe technique as needle passes into vein and away from major vessels, minimize bleeding (Agarwal and Dinda 2013).







## Renal Biopsy - Limitations

- A renal biopsy provides only a cross-sectional snapshot image of the renal pathophysiology (Dhaun et al. 2014).
- Based on the overall clinical picture, the clinician must then weigh up the relative benefits and potential toxicities of therapy and not just specific renal pathology (Dhaun et al. 2014).



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## Safety surrounding Renal Biopsy

- Computed tomography-guided renal biopsy exposes the patient to the risks of radiation (Dhaun et al. 2014).
- Haematuria and sufficient bleeding may lead to blood transfusion request and an ultrasound may also be part of the care plan (Dhaun et al. 2014).
- Pre-Biopsy Desmopressin (0.3ug/kg given 1hr before biopsy) appears to have a role in reducing the bleeding complications after renal biopsy (Dhaun et al. 2014).





## Research

- Renal biopsy is not only advantageous to CKD clinical management, but can better establish epidemiology of disease and direction of treatment protocol/s (Dhaun et al. 2014).
- In specific patient groups, renal biopsy is more often considered, and accompanies best practice (Dhaun et al. 2014).



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## Biopsy Complications

The main complication of renal biopsy is bleeding.

### Additionally

- Silent haematoma (detectable on post biopsy imaging),
- Macroscopic haematuria,
- Blood loss necessitating a blood transfusion,
- Uncommonly, more severe bleeding requiring angiographic intervention,
- Nephrectomy (removal of kidney)



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## Pregnancy and Renal Biopsy

- Pregnancy is not a contraindication to carrying out percutaneous renal biopsy (Dhaun et al. 2014).
- Consistently should be given to defer the procedure until the postpartum period, unless it may change management before delivery (Dhaun et al. 2014).
- Transcutaneous renal biopsy in the prone position is technically difficult in the third trimester (Dhaun et al. 2014).



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## Renal Biopsy in the Elderly

- Evidence suggests that in specific clinical settings, renal biopsy often provides crucial diagnostic and prognostic information, and changes treatment in as many as 40% of elderly patients (Dhaun et al. 2014).
- Performing renal biopsies in very elderly patients is not associated with any greater risk of complications than in younger patients (Dhaun et al. 2014).
- It is a valuable diagnostic tool that should be actively considered in elderly patients, given the appropriate indications and a clinical setting that maximises the potential benefits (Dhaun et al. 2014).





## Renal Biopsy and Diagnosis

- In number of scenarios, renal biopsy can be used as an adjunct to clarify/ support a diagnosis suggested by the results of other tests (Dhaun et al. 2014).
- In patient presenting with urinary abnormalities such as haematuria and/ or proteinuria the renal biopsy will help confirm the histological characteristics compatible with the diagnosis (Dhaun et al. 2014).
- 'Diagnostic cross talks' is a result of renal biopsy and other clinical investigations. It is particularly important in the setting of renal transplantation, with antibody-mediated rejection (Dhaun et al. 2014).
- The histological findings on biopsy influences the prognosis and the choice of therapy (Dhaun et al. 2014).





## Bone Biopsy in CKD-MBD

- Bone Biopsy is gold standard to evaluate bone turnover (Waziri et al. 2014).
- Bone biopsy is known, but less frequently utilized because it is an invasive method and that requires highly skilled personnel to interpret tissue samples (Waziri et al. 2014).
- Also, repeating bone biopsies for monitoring evaluation of bone turnover is impossible (Waziri et al. 2014).
- The use of multiple bone biopsies as a gold standard for diagnosing and monitoring renal osteodystrophy is useful, but impractical (Waziri et al. 2014).





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